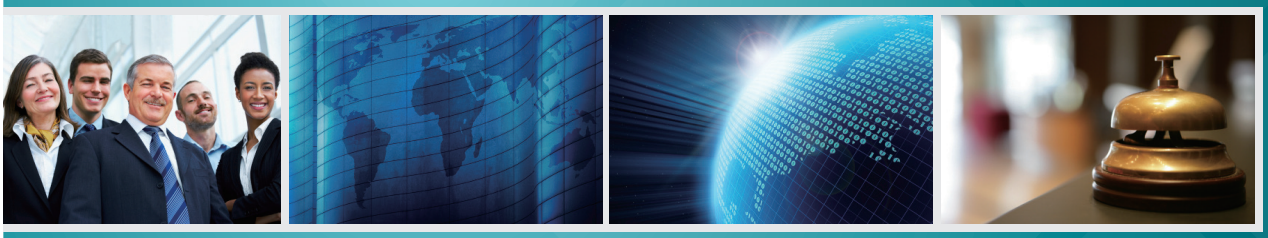
Lanner

Network Application Platforms

Hardware platforms for next generation networking infrastructure



FW-7525 V0.2 Preliminary

User's Manual

Publication date:2014-10-08

About

About

Overview

Icon Descriptions

The icons are used in the manual to serve as an indication of interest topics or important messages. Below is a description of these icons:

NOTE: This check mark indicates that there is a note of interest and is something that you should pay special attention to while using the product.

WARNING: This exclamation point indicates that there is a caution or warning and it is something that could damage your property or product.

Online Resources

The listed websites are links to the on-line product information and technical support.

Resource	Website
Lanner	http://www.lannerinc.com
Product Resources	http://www.lannerinc.com/download-center/
RMA	http://eRMA.lannerinc.com

Copyright and Trademarks

This document is copyrighted, © 2014. All rights are reserved. The original manufacturer reserves the right to make improvements to the products described in this manual at any time without notice.

No part of this manual may be reproduced, copied, translated or transmitted in any form or by any means without the prior written permission of the original manufacturer. Information provided in this manual is intended to be accurate and reliable. However, the original manufacturer assumes no responsibility for its use, nor for any infringements upon the rights of third parties that may result from such use.

Acknowledgement

Intel, Pentium and Celeron are registered trademarks of Intel Corp.

Microsoft Windows and MS-DOS are registered trademarks of Microsoft Corp.

All other product names or trademarks are properties of their respective owners.

Compliances

CE

This product has passed the CE test for environmental specifications. Test conditions for passing included the equipment being operated within an industrial enclosure. In order to protect the product from being damaged by ESD (Electrostatic Discharge) and EMI leakage, we strongly recommend the use of CE-compliant industrial enclosure products.

FCC Class B

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in in a residential environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a commercial area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Safety Guidelines

Follow these guidelines to ensure general safety:

- Keep the chassis area clear and dust-free during and after installation.
- Do not wear loose clothing or jewelry that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses if you are working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe.
- Disconnect all power by turning off the power and unplugging the power cord before installing or removing a chassis or working near power supplies
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit; always check the circuit.

About

LITHIUM BATTERY CAUTION:

Risk of Explosion if Battery is replaced by an incorrect type. Dispose of used batteries according to the instructions

Operating Safety

Electrical equipment generates heat. Ambient air temperature may not be adequate to cool equipment to acceptable operating temperatures without adequate circulation. Be sure that the room in which you choose to operate your system has adequate air circulation.

Ensure that the chassis cover is secure. The chassis design allows cooling air to circulate effectively. An open chassis permits air leaks, which may interrupt and redirect the flow of cooling air from internal components.

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD damage occurs when electronic components are improperly handled and can result in complete or intermittent failures. Be sure to follow ESD-prevention procedures when removing and replacing components to avoid these problems.

Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

Periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohms).

EMC Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a commercial area is likely to cause harmful interference in which case users will be required to correct the interference at their own expense.

Consignes de sécurité

Suivez ces consignes pour assurer la sécurité générale :

- Laissez la zone du châssis propre et sans poussière pendant et après l'installation.
- Ne portez pas de vêtements amples ou de bijoux qui pourraient être pris dans le châssis. Attachez votre cravate ou écharpe et remontez vos manches.
- Portez des lunettes de sécurité pour protéger vos yeux.
- N'effectuez aucune action qui pourrait créer un danger pour d'autres ou rendre l'équipement dangereux.
-
- Coupez complètement l'alimentation en éteignant l'alimentation et en débranchant le cordon d'alimentation avant d'installer ou de retirer un châssis ou de travailler à proximité de sources d'alimentation.
- Ne travaillez pas seul si des conditions dangereuses sont présentes.
- Ne considérez jamais que l'alimentation est coupée d'un circuit, vérifiez toujours le circuit. Cet appareil génère, utilise et émet une énergie radiofréquence et, s'il n'est pas installé et utilisé conformément aux instructions des fournisseurs de composants sans fil, il risque de provoquer des interférences dans les communications radio.

Avertissement concernant la pile au lithium

- Risque d'explosion si la pile est remplacée par une autre d'un mauvais type.
- Jetez les piles usagées conformément aux instructions.
- L'installation doit être effectuée par un électricien formé ou une personne formée à l'électricité connaissant toutes les spécifications d'installation et d'appareil du produit.
- Ne transportez pas l'unité en la tenant par le câble d'alimentation lorsque vous déplacez l'appareil.
- La machine ne peut être utilisée qu'à un lieu fixe comme en laboratoire, salle d'ordinateurs ou salle de classe.

About

Sécurité de fonctionnement

- L'équipement électrique génère de la chaleur. La température ambiante peut ne pas être adéquate pour refroidir l'équipement à une température de fonctionnement acceptable sans circulation adaptée. Vérifiez que votre site propose une circulation d'air adéquate.
- Vérifiez que le couvercle du châssis est bien fixé. La conception du châssis permet à l'air de refroidissement de bien circuler. Un châssis ouvert laisse l'air s'échapper, ce qui peut interrompre et rediriger le flux d'air frais destiné aux composants internes.
- Les décharges électrostatiques (ESD) peuvent endommager l'équipement et gêner les circuits électriques. Des dégâts d'ESD surviennent lorsque des composants électroniques sont mal manipulés et peuvent causer des pannes totales ou intermittentes. Suivez les procédures de prévention d'ESD lors du retrait et du remplacement de composants.

  - Portez un bracelet anti-ESD et veillez à ce qu'il soit bien au contact de la peau. Si aucun bracelet n'est disponible, reliez votre corps à la terre en touchant la partie métallique du châssis.

  Vérifiez régulièrement la valeur de résistance du bracelet antistatique, qui doit être comprise entre 1 et 10 mégohms (Mohms).

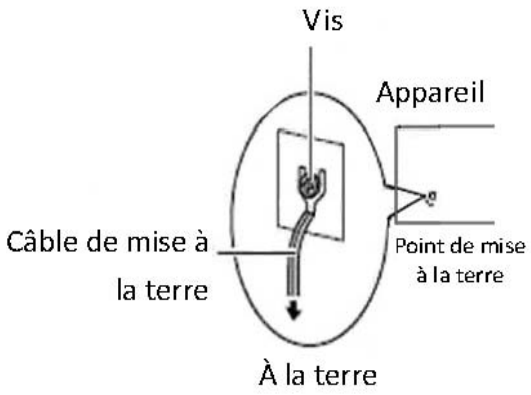
Consignes de sécurité électrique

- Avant d'allumer l'appareil, reliez le câble de mise à la terre de l'équipement à la terre.
- Une bonne mise à la terre (connexion à la terre) est très importante pour protéger l'équipement contre les effets néfastes du bruit externe et réduire les risques d'électrocution en cas de foudre.
- Pour désinstaller l'équipement, débranchez le câble de mise à la terre après avoir éteint l'appareil.
- Un câble de mise à la terre est requis et la zone reliant les sections du conducteur doit faire plus de 4 mm2 ou 10 AWG.

Procédure de mise à la terre pour source d'alimentation CC Procédure de mise à la terre pour source d'alimentation CC

- Desserrez la vis du terminal de mise à la terre.
- Branchez le câble de mise à la terre à la terre.
- L'appareil de protection pour la source d'alimentation CC doit fournir 30 A de courant.

Cet appareil de protection doit être branché à la source d'alimentation avant l'alimentation CC.



Version	***Changes***
0.2	Add the BIOS menu information

Table of Contents

Chapter 1: Introduction 1

System Specifications . . . 1
Ordering Information . . . 2
Package Contents . . . 2
Optional Accessories . . . 2
Front Panel Features . . . 3
Rear Panel Features . . . 4

Chapter 2: Hardware Setup 5

Preparing the Hardware Installation . . . 5
Installing the System Memory . . . 5
Installing the Hard Disk . . . 5
Installing the CompactFlash Card . . . 6
Installing the Mini-PCIe Card . . . 6

Chapter 3: Motherboard Information 7

Block Diagram . . . 7
Motherboard Layout . . . 8
Jumper Settings . . . 9

Chapter 4: BIOS Settings 13

Accessing the BIOS menu . . . 13
Navigating the BIOS menu . . . 13
The Main Menu . . . 14
Advanced Settings . . . 15
Intel RCSetup . . . 22
Security Settings . . . 25
Boot Configuration . . . 26
Save & Exit . . . 27
Save and Exit . . . 27

Appendix A: Programming Watchdog Timer 28

Appendix B: Setting up Console Redirections 29

Appendix C: Programming Generation 2 LAN Bypass 30

Lanner Generation 2 Bypass . . . 30

Appendix D: Installing Intel QuickAssist Software for Linux 32

Appendix E: Terms and Conditions 33

Warranty Policy . . . 33
RMA Service . . . 33

Chapter 1: Introduction

Thank you for choosing the FW-7525. This system integrates the newest Intel® Atom Processor C2358 processor, codenamed Rangeley, with the Intel QuickAssist technology to provide a robust and high-performance communication platform. It supports up to 8GB of Non-ECC DDR3 memory at 1333 MHz.

The C2000 series processor comes with an enhanced cryptographic/content processing acceleration via integrated Intel®QuickAssist Integrated Accelerator:

–Bulk Encryption: AES, DES, 3DES, RC4

–Hash: SHA-1, MD5; SHA-2 (SHA-224, SHA-256, SHA-384, SHA-512);

–Authentication: HMAC, AES-XCBC, AES-CCM, and AES-GCM

–Public Key Exchanges: RSA, DH, DSA, ECC

The processor also supports Intel Virtualization Technology.

The FW-7525 features fanless design with low power consumption. It only weights 1.2kg in its compact chassis—177 X 44 X 145.5 mm.

The FW-7551 is equipped with advanced I/O capabilities ,which incorporates a console port, one Serial-ATA port and two USB 2.0 ports as well as a ComplactFlash slot. The system also has 6 GbE ports. In addition, the 2 (of all 6) LAN ports are equipped with Lanner proprietary Generation 2 bypass.

Please refer to the chart below for a summary of the system's specifications.

Note: For instructions on quick installation and acquiring the Intel® Atom™ Processor C2000 Product Family for Communications Infrastructure Software for Linux* Software package, refer to the attached PDF file.

System Specifications

Form Factor		Desktop
Platform	Processor Options	2-core Intel® Atom Processor C2358 (Codenamed "Rangeley")
BIOS		AMI BIOS 16MB
System Memory	Technology	Single Channel Non-ECC DDR31333 MHz, 1.5 V
	Max. Capacity	8 GB
	Socket	1 x 204-pin SO-DIMM
OS Support		Linux Kernel 2.6 or above
Storage	HDD Bays	1 x 2.5" SSD kit
	CompactFlash	1 x Type II CompactFlash
Networking	Ethernet Ports	4 or 6 x GbE RJ45 onboard
	Bypass	1 pairs Generation 2 (on model FW-7525A only)
	Controllers	2 x Intel i210AT, 4 x Marvell 88E1543
	Ethernet Modules	N/A
	Management Port	N/A
I/O Interface	Reset Button	1 x reset button Software reset by default
	Console	1 x RJ45
	USB	2 x USB 2.0
	IPMI via OPMA slot	N/A
	Display	N/A
Expansion	PCIe	1 x Mini-PCIe
	PCI	N/A
Cooling	Processor	Fanless
	System	Fanless
Environmental Parameters	Temperature, ambient operating / storage	0 ~ 40° C / -20~70° C
	Humidity (RH), ambient operating / ambient non-operating	5~90%, non-condensing / 5~95%, non-condensing
Miscellaneous	LCD Module	N/A
	Watchdog	Yes
	Internal RTC with Li Battery	Yes
Physical Dimensions	Dimensions (WxHxD)	177 x 44 x 145.5 mm
	Weight	1.2 kg
Power	Type/Watts	36W Power Adapter
	Input	100~240V@50~60Hz

Approvals and Compliance	CE Class B, FCC Class B, RoHS

Ordering Information

FW-7525A	Fanless Network Security Appliance with Intel® AtomTM processor C2358 (Code-named "Rangeley"), 6 GbE LAN ports with Gen.2 Bypass, 36W power adapter
FW-7525B	Fanless Network Security Appliance with Intel® AtomTM processor C2358 (Code-named "Rangeley"), 4 GbE LAN ports without Bypass, 36W power adapter

Package Contents

Your package contains the following items:

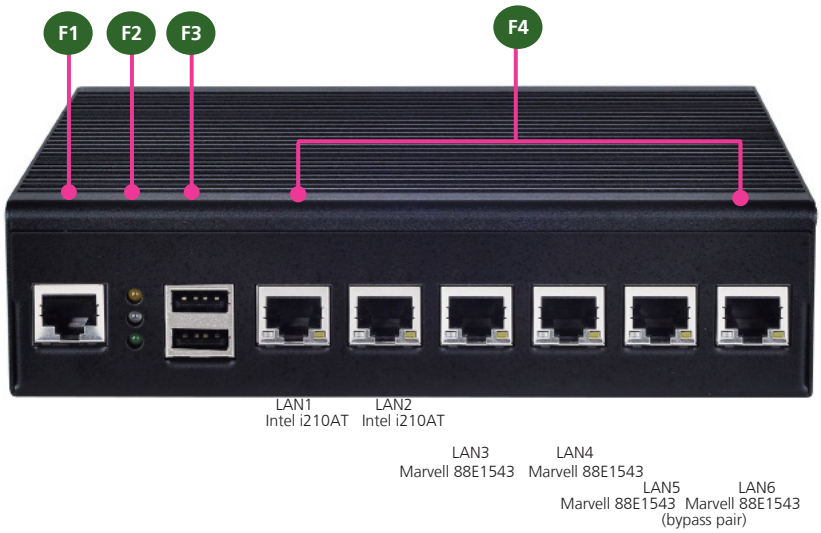
- FW-7525 Network Security Platform
- Power cable
- 1 console cable
- Drivers and user's manual CD.

Optional Accessories

The system has a variety of optional accessories, visit the following website for more information.

http://www.lannerinc.com/products/x86-network-appliances/rackmount/fw-7525

Front Panel Features



F1 Console Port

By using suitable rollover cable or RJ-45 to DB-9 console cable, you can connect to a computer terminal for diagnostic or configuration purpose. Terminal Configuration Parameters: 115200 baud, 8 data bits, no parity, 1 stop bit , no flow control. Besides this port, these is also another COM port via internal pin headers.s

F2 HDD/Status/Power LED

Power: If the LED is on it indicates that the system is powered on. If it is off, it indicates that the system is powered off.

Status: This LED is programmable. You could program it to display the operating status with the following behavior:

If the LED is green, it indicates that the system's operational state is normal. If it is red, it indicates that the system is malfunctioning.

HDD: If the LED blinks, it indicates data access activities; otherwise, it remains off.

F3 Two USB 2.0 Ports

It connects to any USB devices, for example, a flash drive. Besides this dual USB port, there is another USB port via internal pin headers.

F4 Ethernet Ports (LAN1: PXE-capable Port, LAN5-LAN6: bypass pair*)

LAN3~LAN6 GbE ports are provided by Marvell 88E1543 and LAN1~LAN2 are provided by Intel i210AT. *LAN1* is capable of Preboot eXecution Environment (PXE) (This feature needs to be enabled or disable in the BIOS; the default is disabled). One pair (LAN5-LAN6) can be configured as LAN Bypass by using Lanner Gen2 Bypass technology when failure events occur. This feature can be enabled dynamically with a watch dog timer. Refer to your User's Manual CD for sample implementation of this feature.

Note:

1. The LAN bypass functionality is only available on model FW-7525A.
2. The FW-7525B only has 4 Ethernet ports.

Rear Panel Features

R1 Reset Switch

The reset switch can be used to reboot the system without turning off the power. It could act as a software or a hardware reset with jumper settings. Refer to ***Chapter 3 Motherboard Information*** for more information.

R2 ATX Power-on button with LEDs

Standby mode in Red; Power-on mode in Green

R3 Power-in Socket

The system requires 36W power.

Chapter 2: Hardware Setup

Preparing the Hardware Installation

To access some components and perform certain service procedures, you must perform the following procedures first.

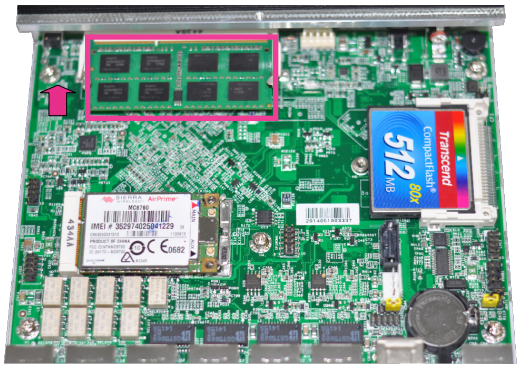
WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power On/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

1. Unpower the FW-7525 and remove the power cord.
2. Unscrew 3 screws on each side and on the bottom of the cover of the FW-7525 System.
3. Slide the cover backwards to open it.

Installing the System Memory

The motherboard supports DDR3 memory that features data transfer rates of 1333, 1600 MHz to meet the higher bandwidth requirement of the latest operating system and Internet applications. To install the memory:

1. Aligh the SO-DIMM's key with the socket's notch.
2. Install the memory.



Note:

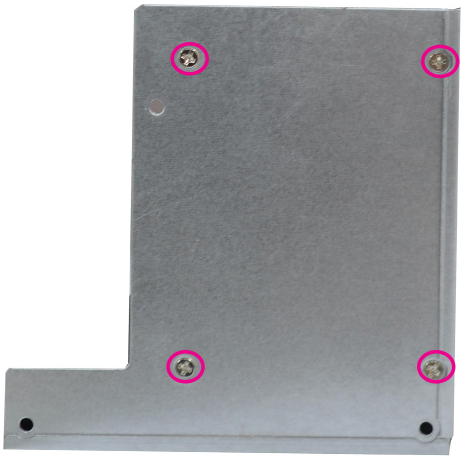
1. The system requires **Non-ECC DDR3 1333 MHz** memory**.** Do not install memories with different specifications.
2. The system can support up to 8 GB in maximum.

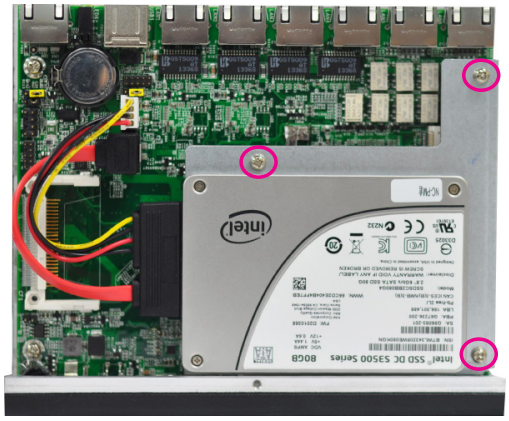
Installing the Hard Disk

The system can accommodate one SSD disk. Follow these steps to install a hard disk into the FW-7525:

1. Place hard disk on the hard disk tray and align the holes of the hard disk with the mounting holes on the tray.
2. Secure the hard disk with 4 mounting screws through the bottom holes of the hard disk tray.
3. Connect the Serial-ATA cable to the hard disk.
4. Plug the Serial-ATA power and data disk cables to the Serial-ATA power and drive connectors on the main board.
5. Put the hard disk tray with the installed hard disk back to the system and secure it with the mounting screws. In order to install the HDD above the system board, you need to replace the threded screws on the board with the standoffs included in the HDD kit.

SSD installation





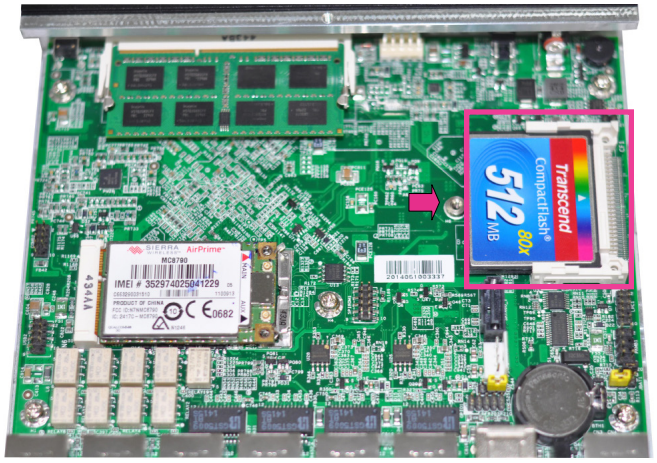
Note:

1. The SSD kit is not included in the package; order it separately.

Installing the CompactFlash Card

FW-7525 provides one CompactFlash slot. Follow the procedures bellow for installing a CompactFlash card.

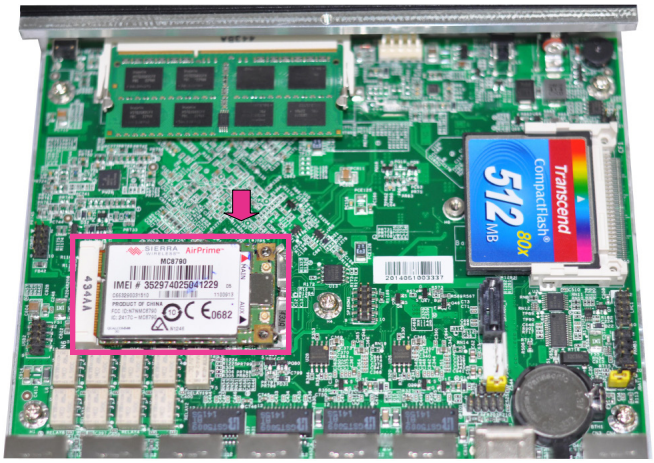
1. Align CompactFlash card and the card slot with the arrow pointing toward the connector. The card fits only the correct way into the slot; do not force the card into the slot.
2. Push the card to insert into the connector.



Installing the Mini-PCIe Card

FW-7525 provides one Mini-PCIe slot. Follow the procedures bellow for installing a mini-PCIe card.

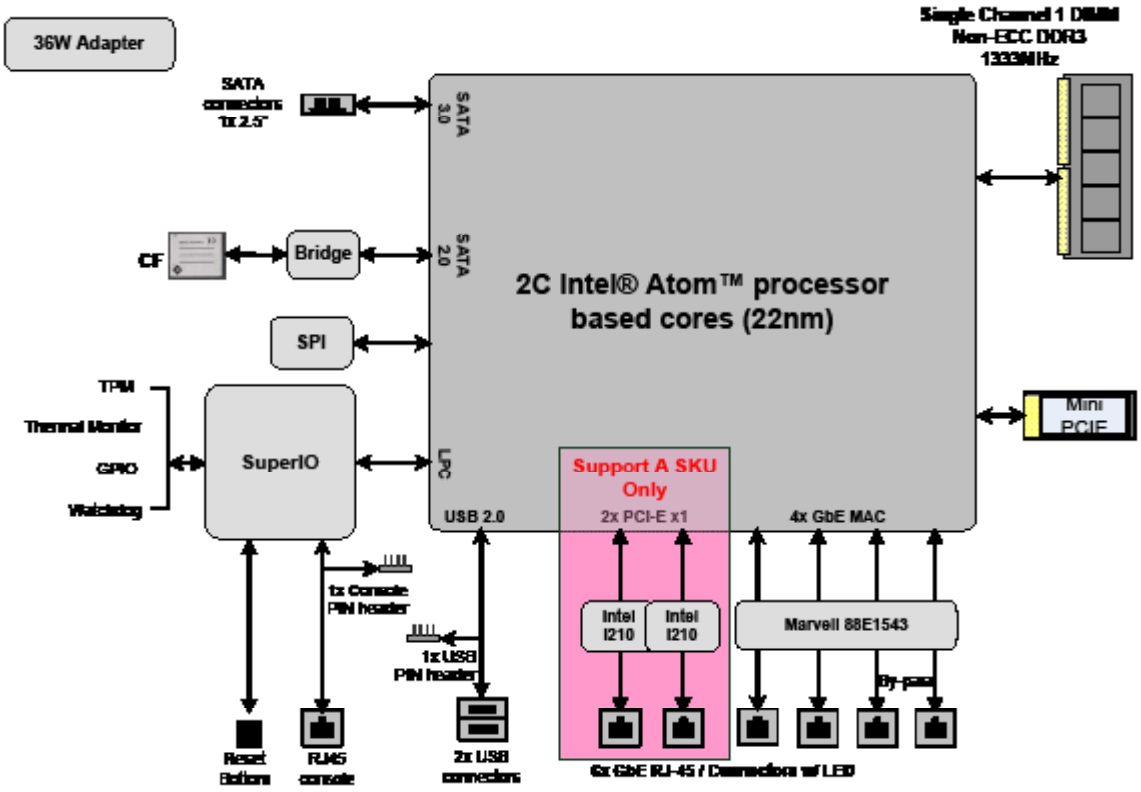
1. Align Mini-PCIe card key with the card slot notch
2. Push the other end of the card to be tightened with the latch.



Chapter 3: Motherboard Information

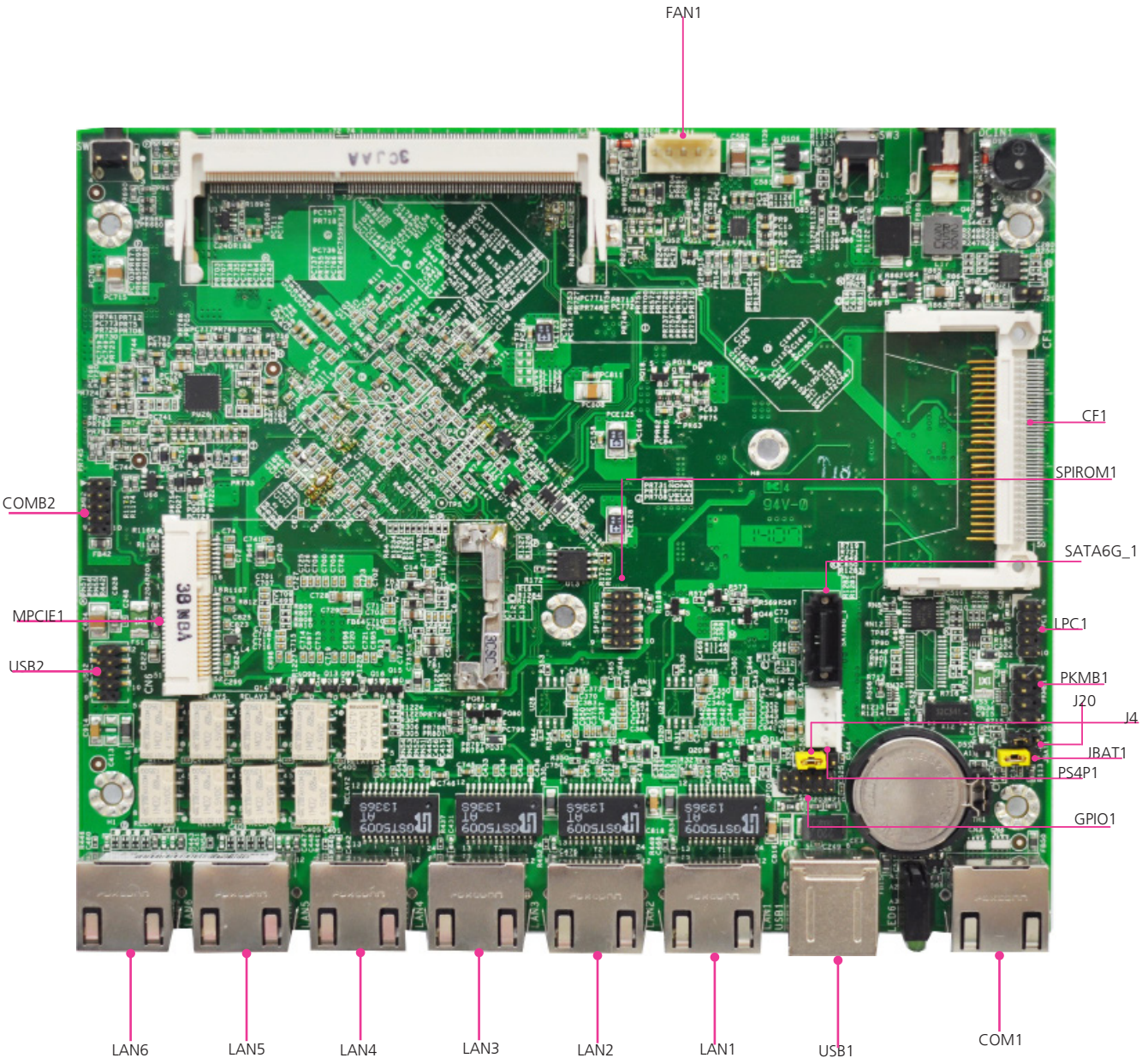
Block Diagram

The block diagram depicts the relationships among the interfaces or modules on the motherboard. Please refer to the following figure for your motherboard's layout design.



Motherboard Layout

The motherboard layout shows the connectors and jumpers on the board. Refer to the following picture as a reference of the pin assignments and the internal connectors.

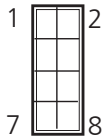


Jumper Settings

Fan Connectors(FAN1): The 5-pin connector is for connecting the CPU fan.

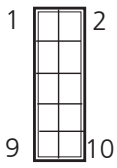
Pin No.	Signal
1	PWM
2	NC
3	TACH
4	P12V
5	GND

Keyboard and Mouse Connector (PKMB1)



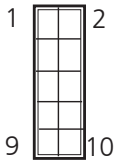
Pin No.	Signal	Pin No.	Signal
1	+P5V_KM	2	MS_L_CLK
3	MS_L_DAT	4	NC
5	KB_L_DAT	6	NC
7	GND	8	KB_L_CLK

COM Port 2 (COMB2): The internal COM port



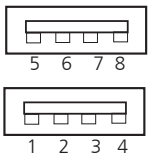
Pin No.	Signal	Pin No.	Signal
1	NDCD2-	2	NDSR2-
3	NSIN2	4	NRTS2-
5	NSOUT2	6	NCTS2-
7	NDTR2-	8	NRI2-
9	COMGND2	10	

USB Pin Header (USB2): It is for connecting the USB module cable. It complies with USB2.0 and support up to 480 Mbps connection speed.



Pin No.	Signal	Pin No.	Signal
1	+P5V_USB2_L	2	NC
3	USB2_SB_L_DN	4	NC
5	USB2_SB_L_DP	6	NC
7	GND	8	GND
9	GND	10	Key ping

Dual USB 2.0 Ports (USB1): This provides two USB 2.0 ports on the front panel.

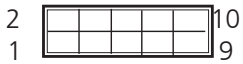


Pin No.	Signal
1	+P5V_USB0_L
2	USB0_SB_L_DN
3	USB0_SB_L_DP
4	GND
5	+P5V_USB0_L
6	USB1_SB_L_DN
7	USB1_SB_L_DP
8	GND

Console Port (COM1): The external COM port with RJ45 connector

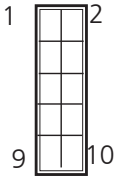
Pin No.	Signal	Pin No.	Signal
1	LNRTSA#	5	GND
2	LNDTRA#	6	LNSINA
3	LNSOUTA	7	LNDSRA#
4	GND	8	LNCTSA#

GPIO Output Pin (GPIO1): Theses pins can be used to write to an internal register to control the GPIO output pin state.



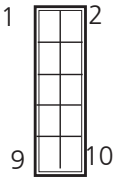
Pin No.	Function	Pin No.	Function
1	SIO_GP20	2	SIO_GP21
3	SIO_GP46	4	SIO_GP47
5	SIO_GP53	6	SIO_GP54
7	SIO_GP56	8	SIO_GP57
9	P5V	10	GND

SPI-ROM Update Connector (SPIROM1): It is for updating the SPI Flash soldered on board for service and repair purposes.



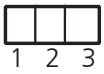
Pin No.	Function	Pin No.	Function
1	SPI_HOLD0_L	2	NC
3	PMU_AVN_SPI_R_CS0	4	V_3P3_SPI
5	PMU_AVN_SPI_MISO	6	NC
7	NC	8	PMU_AVN_SPI_R_CLK
9	GND	10	PMU_AVN_SPI_R_MOSI

LPC I/O bus (It can also be called Port 80) (LPC1): It is a proprietary connector for connecting a checkpoint device to output checkpoints throughout booting and Power-On Self Test (POST) to indicate the task the system is currently executing.



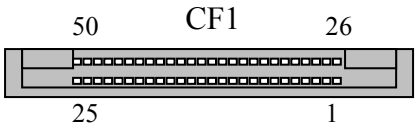
Pin No.	Function	Pin No.	Function
1	CLK_33M_P80	2	LPC_AD1
3	PLTRST_PORT80_N	4	LPC_AD0
5	LPC_FRAME_N	6	P3V3
7	LPC_AD3	8	Key ping
9	LPC_AD2	10	GND

Clear CMOS jumper (JBAT1): It is for clearing the CMOS memory and system setup parameters by erasing the data stored such as the system passwords in the CMOS RAM.



Pin No.	Function
1	VBAT
2	PCH_RTCRST_N
3	GND

CompactFlash Connector (CF1): It is for connecting a Compact Flash card to be served as your system's storage. The connector is a CF Type II slot which could fit both CF Type I or CF Type II cards.



Pin No.	Function	Pin No.	Function
1	GND	26	DET1
2	CF_DD3	27	CF_DD11
3	CF_DD 4	28	CF_DD 12
4	CF_DD 5	29	CF_DD 13
5	CF_DD 6	30	CF_DD 14
6	CF_DD 7	31	CF_DD 15
7	-CF_DCS0	32	-CF_DCS1
8	GND	33	CF_VS1
9	GND	34	CF_DIOR_N
10	GND	35	CF_DIOW_N
11	GND	36	WE#
12	GND	37	CF_IDEIRQ
13	VCC_CF	38	VCC_CF
14	GND	39	MST_SLV
15	GND	40	CF_VS2
16	GND	41	CF_IDERST_N
17	GND	42	CF_IORDY
18	CF_DA2	43	CF_DMARQ
19	CF_DA 1	44	CF_DDACK_N
20	CF_DA 0	45	CFACT_N
21	CF_DD0	46	CF_PDIAG
22	CF_DD 1	47	CF_DD 8
23	CF_DD 2	48	CF_DD 9
24	GND	49	CF_DD 10
25	DET2	50	GND

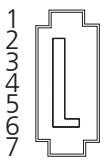
SO-DIMM Socket (CN1): The 204-pin DDR3 SO-DIMM is for connecting the Non-ECC DDR3 1333 memory. The system can support up to 8 GB in maximum.

SATA Connector (SATA6G_1): It is for connecting a SATA harddisk to be served as your system's storage. The system can accommodate one disk (2.5) with SATA 3.0 standard. The controller contains two modes of operation—a legacy mode using I/O space, and an AHCI mode using memory space. Software that uses legacy mode will not have AHCI capabilities.

The AHCI (Advanced Host Controller Interface) is a programming interface which defines transactions between the SATA controller and software and enables advanced performance and usability with SATA. Platforms supporting AHCI may take advantage of performance features such as no master/slave designation for SATA devices—each device is treated as a master—and hardware assisted native command queuing. AHCI also provides usability enhancements such as Hot-Plug.

Note:

1. You will need to configure your SATA as AHCI mode in the BIOS in order to use the advanced features of SATA. To do this, access the BIOS menu under IntelRCSetup-> South Bridge Chipset Configuration->SATA Configuration.
2. Also, the hotplug enable/disable option is under the same SATA Configuration menu. Enable the hotplug function explicitly in this menu if you need it.



Pin No.	Signal
1	GND
2	TX_P
3	TX_N
4	GND
5	RX_N
6	RX_P
7	GND

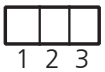
4-Pin SATA Power Connector (PS4P1)

Pin No.	Signal
1	+12V
2	Ground
3	Ground
4	5V

AT-Mode Power Button Connector (J21) It is for connecting the power switch in AT mode.

Pin No.	Signal
1	P3VSB
2	MR

Hardware or Software Reset Jumper(J4): The jumper can be adjusted to be in either hardware or software reset mode when the reset switch is pressed. The hardware reset will reboot the system without turning off the power. The software reset can be programmed to reset a software to its default setting.



Pin No.	Signal
1-2	Hardware reset
2-3	Software reset

PCIe Expansion Connector (MPCIEC1): Mini-PCIe connector

PIN NO.	FUNCTION	PIN NO.	FUNCTION
1	PMU_WAKE#	27	GND
2	VCC3	28	1.5V
3	NC_RSV1	29	GND
4	GND	30	SMB_CLK
5	NC_RSV2	31	MINI_PCIE_TXN0
6	1.5V	32	SMB_DATA
7	MINI_CLKREQ_N1	33	MINI_PCIE_TXP0
8	NC_UIM_PWR	34	GND
9	GND	35	GND
10	NC_UIM_DATA	36	USB_IO3_DN
11	MINIPCIE_REF-CLKN	37	GND
12	NC_UIM_CLK	38	USB_IO3_DP
13	MINIPCIE_REFCLKP	39	VCC3
14	NC_UIM_RST	40	GND
15	GND	41	VCC3
16	NC_UIM_VPP	42	NC_LED_WWAN#
17	NC_RSV3	43	GND
18	GND	44	NC_LED_WLAN#
19	NC_RSV4	45	NC_RSV9
20	RF_KILL_N2_R	46	NC_LED_WPAN#
21	GND	47	NC_RSV10
22	PLTRST_MINIPCIE_N	48	1.5V
23	MINI_PCIE_RXN0	49	NC_RSV11
24	P3VSB	50	GND
25	MINI_PCIE_RXP0	51	NC_RSV12
26	GND	52	VCC3

Chapter 4: BIOS Settings

Accessing the BIOS menu

When you are installing a motherboard or when the system prompts "Run Setup" during start-up, you will use the BIOS Setup program to configure the system, . This section explains how to configure your system using this program.

Even if you are not prompted to enter the BIOS Setup program when you are installing a motherboard, you can still change the configuration of your computer later on with this program. For example, you may want to enable the security password feature or change the power management settings. This requires you to reconfigure your system by using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM .

When you start up the computer, the system provides you with the opportunity to run this program. Press <Delete> during the Power-On-Self-Test (POST) to enter the Setup utility (There are a few cases that other keys may be used, such as <F1>, <F2>, and so forth.); otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

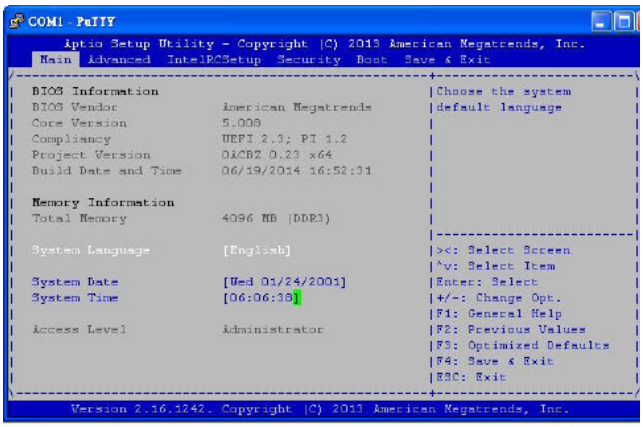
The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

Note: This manual describes the standard look of the setup screen. There may be some instances in which the motherboard features can vary from one to another due to customization. This means that some of the options described in this manual mays not match that of your motherboard's AMIBIOS.

Navigating the BIOS menu

The BIOS setup utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process.

These keys include <F1>, <F10>, <Enter>, <ESC>, <Arrow> keys, and so on.



Keys	Description
-><- Left/Right	The Left and Right <Arrow> keys allow you to select an setup screen. For example: Main screen, Advanced screen, Boot screen, and so on.
Up/Down ^ v	The Up and Down <Arrow> keys allow you to select an setup item or sub-screen.
+- Plus/Minuss	The Plus and Minus <Arrow> keys allow you to change the field value of a particular setup item. For example: Date and Time.
Tab	The <Tab> key allows you to select setup fields.

The Main Menu

The main BIOS setup menu is the first screen that you can navigate. Each main BIOS setup menu option is described in this chapter.

The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. “Grayed-out” options are configured parameters and cannot be modified. On the other hand, Options in blue can be modified.

The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.

System Language

Use this item to choose the BIOS language.

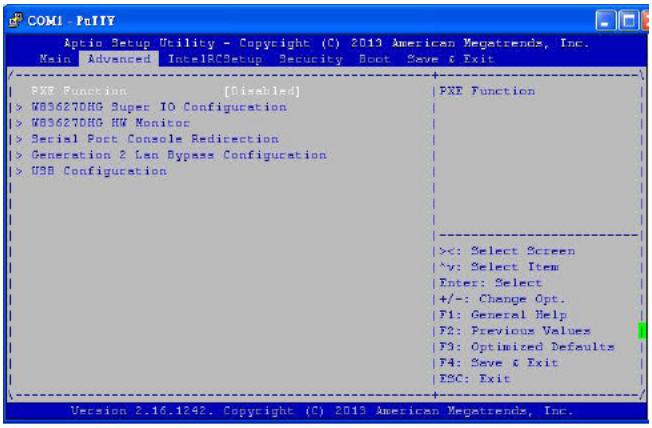
System Time/System Date

Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values through the keyboard. Press the <Tab> key or the <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

Advanced Settings

Select the Advanced tab from the setup screen to enter the Advanced BIOS Setup screen. You can select any of the items in the left frame of the screen, such as SuperIO Configuration, to go to the sub menu for that item. You can display an Advanced BIOS

Setup option by highlighting it using the <Arrow> keys. All Advanced BIOS Setup options are described in this section. The Advanced BIOS Setup screen is shown at the right. The sub menus are described on the following pages.



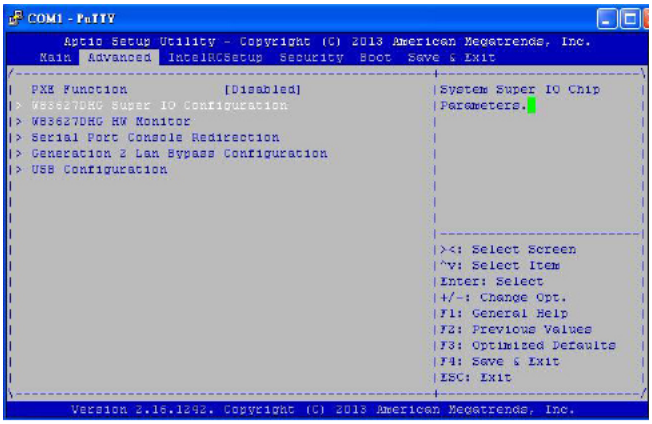
PXE Function

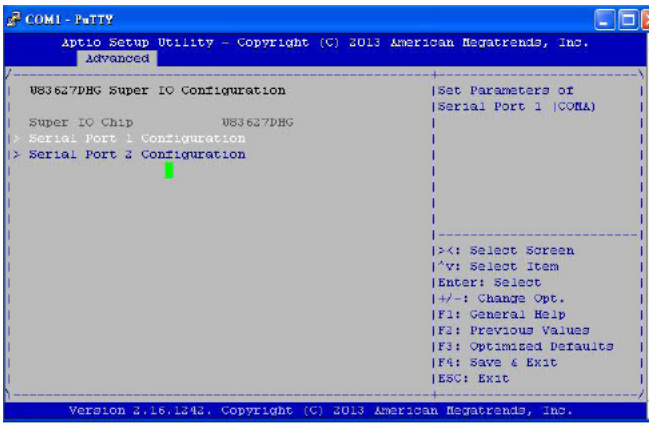
The Preboot eXecution Environment (PXE) allows you to boot computers using a network interface independently of data storage devices (like hard disks) or installed operating systems. Enable or disable this function with this option here. For LAN port that can be configured to PXE function, refer to ***Chapter 1 Introduction***.

Super IO configuration

Serial Port 0/1 Configuration

Item	Selection
Serial Port	Enable or disable this serial port
Device Settings	Shows the serial port base address and the IRQ port





HW Monitor

This menu shows the hardware monitor configuration settings. Select an item then press <Enter> to display the configuration options.

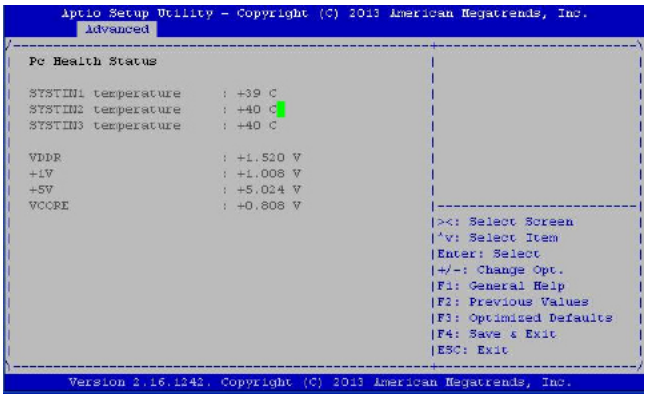
PC Health Status

SYSIN1/SYSIN2/SYSIN3 Temperature

The onboard hardware monitor automatically detects and displays the CPU and motherboard temperatures.

CPU Voltage, 1V voltage, 5V voltage, VCORE, etc

The onboard hardware monitor automatically detects the voltage output through the onboard voltage regulators.



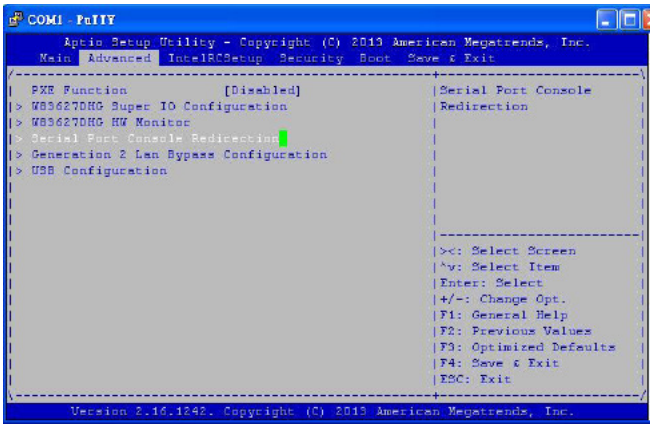
Serial Port Console Redirection

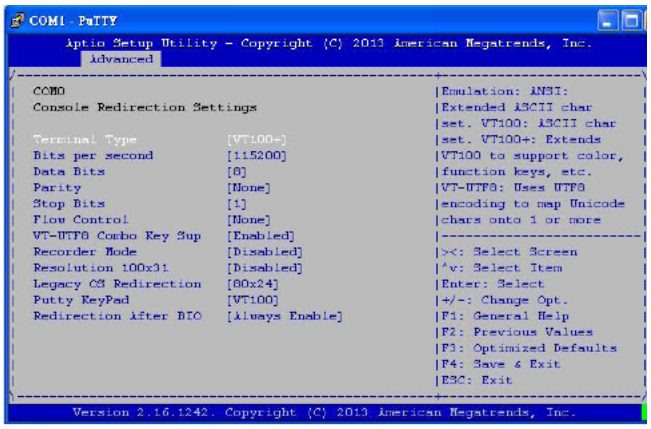
Use this menu to set the settings for BIOS remote access feature.

Item	Selection
Console Redirection	Enable or disable BIOS through remote access
Console Redirection Settings	Enter to view more options

COM0 Console Redirection Settings

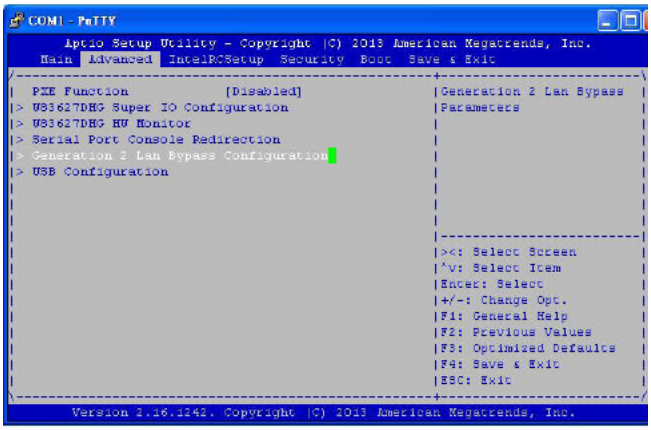
Item	Selection
Terminal Type	Sets the connection terminal type
Bits per second, Data bits, Parity, Stop Bits, Flow Control	Sets the terminal connection parameters such as the baud rate, parity check mechanism, flow control, etc.





Lanner Generation 2 LAN Bypass Configuration

In this screen, you can configure the Lan Bypass functionality. The system can accommodate one LAN module.



Runtime and System off Bypass Settings

You can enable or disable the automatic activation of hardware LAN Bypass function in the event of a power failure. Hardware Bypass can automatically activate to allow network traffic to continue.

The LAN bypass can be turned on or off in two system states, i.e., system on and system off. The following are the BIOS menu and illustration of the possibilities of LAN bypass configuration in each state. Note that according to the result from table 2, the ports are not bypassed in both system-on or system-off state when the setting "System off LAN Bypass for the onboard LAN Ports" is disabled.

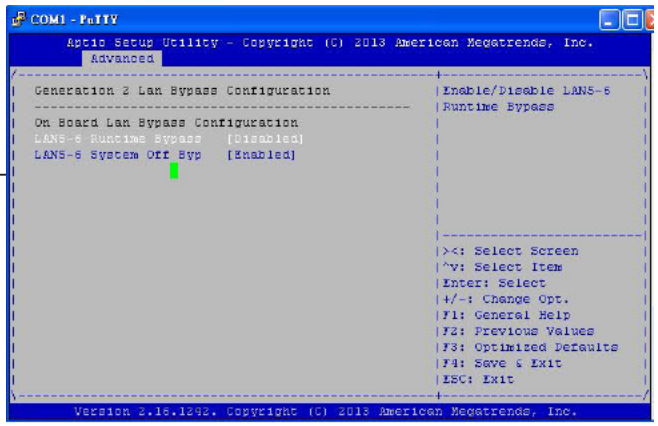


Table 1: System Off Bypass is set to ***enabled***

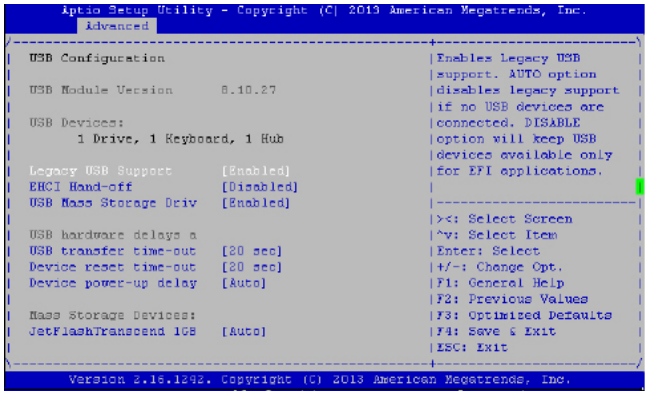
Bypass settings in the BIOS / System Status	Runtime LAN Bypass for the bypass pair		System off LAN Bypass for the by-pass pair
	Enabled	Disabled	***Enabled***
System on	Bypass	Non-Bypass	
System off	Bypass	Bypass	

Table 2: System Off bypass is set to ***disabled***

Bypass settings in the BIOS / System Status	Runtime LAN Bypass for the bypass pair		System off LAN Bypass for the by-pass pair
	Enabled	Disabled	***Disabled***
System on	Non-Bypass	Non-Bypass	
System off	Non-Bypass	Non-Bypass	

USB Configuration

You can use this screen to select options for the USB Configuration. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. The settings are described on the following pages.



Legacy USB Support

This option enable or disable the support for USB devices on legacy operating systems (OS), e.g., Windows ME/98/NT, and MS-DOS. Normally if this option is not enabled, any attached USB mouse or USB keyboard will not become available until a USB compatible operating system is fully booted with all USB drivers loaded. When this option is enabled, any attached USB mouse or USB keyboard can be used on the system even when there is no USB drivers loaded on it.

Option	Description
Auto	Allow the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled If it is not detected, the USB control er legacy mode is disabled.
Enabled	Enable the support for USB devices on legacy operating system
Disabled	Disable this function.

EHCI Hand-Off

Itallowsyoutoenablesupportforoperatingsystemswhichdo nothavetheEnhancedHostControllerInterfacehand-off(EHCI hand-off) feature for USB devices.

Option	Description
Enabled	Enable this feature
Disabled	Disable this feature

USB Mass Storage Driv

In this option, you can enable or disable the attached USB drive to be used as the system's hard drive.

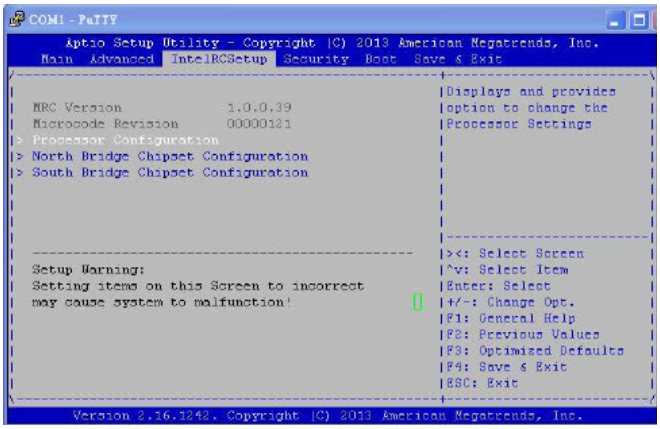
USB Hardware Delays a

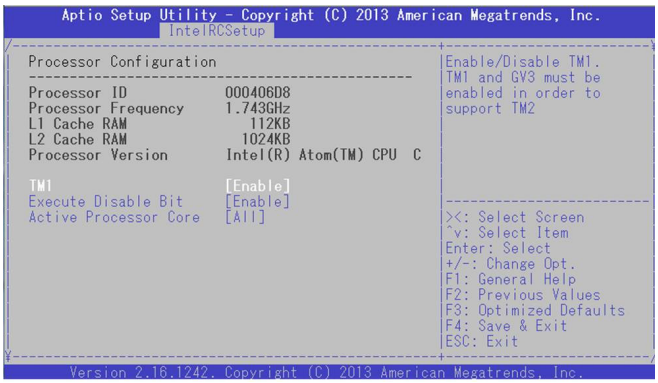
The menu sets delay time for USB operations.

Item	Description
USB transfer time-out	set transfers to an endpoint to complete within a specific time. • If set to zero, transfers will not time out because the host controller will not cancel the transfer. In this case, the transfer waits indefinitely until it is manually canceled or the transfer completes normally. • If set to a nonzero value (time-out interval), the host controller starts a timer when it receives the transfer request. When the timer exceeds the set time-out interval, the request is canceled.
Device reset time-out	This option sets the reset timing for the USB Mass Storage to be initialized. When set to 10 Sec, the BIOS will wait for up to 30 seconds for the USB flash drive to initialize.
Device power-up delay	This option sets the power-up timing for the USB Mass Storage to be initialized.

Intel RCSetup

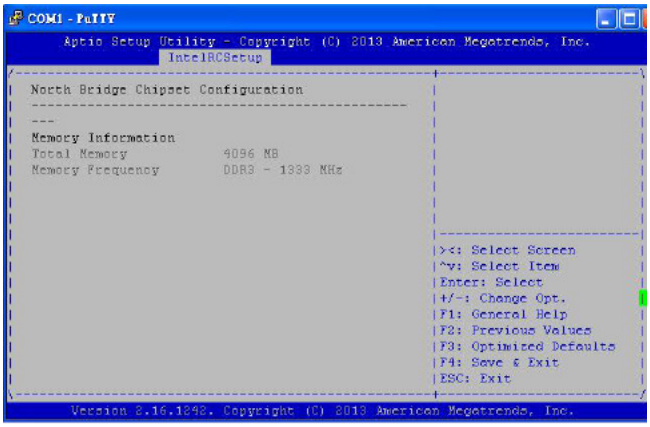
You can use this screen to view the capabilities and of your CPU. You can also use this menu to enable/disable certain functions of your CPU. Use the up and down <Arrow> keys to select an item. Use the <Plus> and <Minus> keys to change the value of the selected option. A description of the selected item appears on the right side of the screen. The settings are described below.



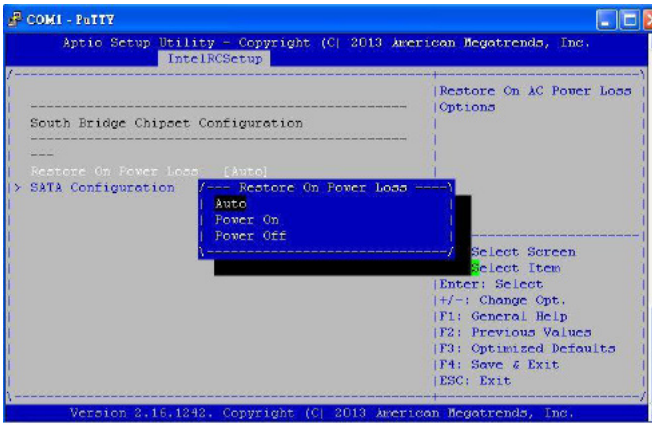


North Bridge Chipset Configuration

It shows the memory information such as the total detected memory and memory frequency.



South Bridge Chipset Configuration



Restore on AC Power Loss

This option lets you set the state of the system when it has just recovered from a power outage.

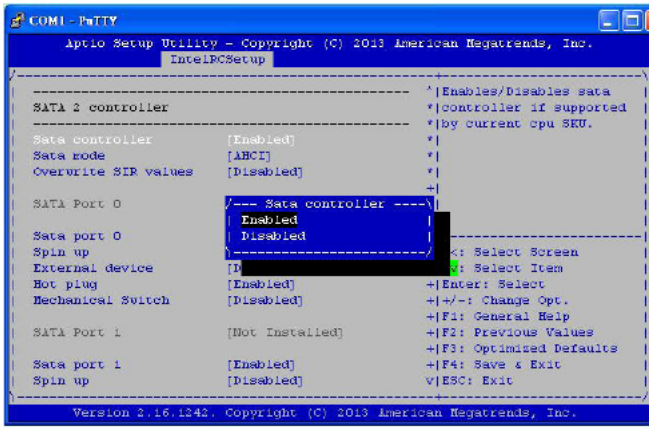
Option	Description
Power Off	When setting to Power Off, the system goes into "off state" after an AC power interruption.
Power On	When setting to Power on, the system turns on automatically after a power interruption
Auto	When setting to Last State, the system goes into whatever the state was before the power interruption.

SATA Controllers Configuration

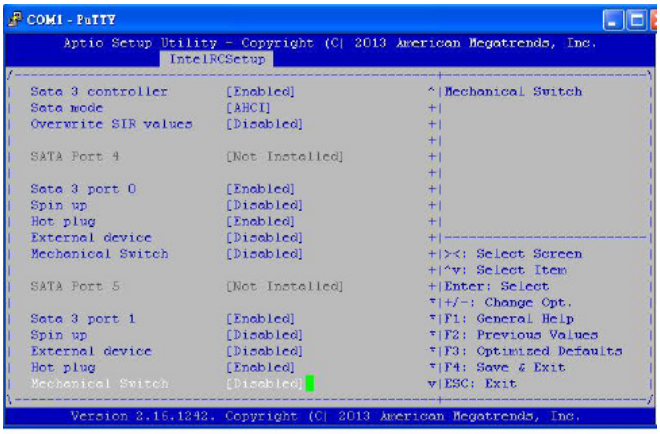
SATA Mode Selection

The system supports various SATA mode.

Item	Selection
IDE Mode	Set to IDE mode when your want to use the Serial-ATA hard disk drives as Parallel ATA physical storage devices.



Item	Selection
AHCI Mode	Set to AHCI mode when you want the SATA hard disk drives to use the AHCI (Advanced Host Controller Interface). The AHCI allows the onboard storage driver to enable advanced SATA features that increases storage performance or workloads where multiple simultaneous read/write requests are outstanding, most often occurring in server-type applications (native command queuing). It also facilitates hot swapping.
Disable	Disable the SATA controller.



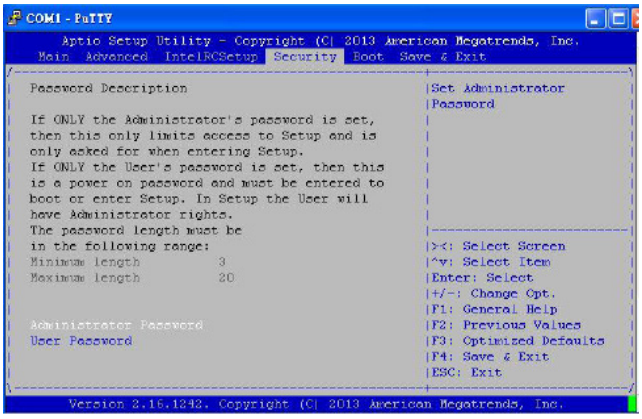
Serial ATA Port 0/1

Use this menu to configure specific SATA Port for all ports on the system.

Option	Description
Spin-Up	Spin-up is a simple mechanism by which the storage subsystem controller can sequence hard disk drive initialization and spin-up. Set to control whether each specific drive will spin up.
External	Enable or disable external SATA connectivity.
Hot Plug	The AHCI of SATA provides hot plug capability to allow drives to be added or removed with the PC running.
Mechanical Switch	Enable this option to support a mechanical presence switch attached to this port. Disable this option to not support a mechanical presence switch attached to this port.

Security Settings

Select Security Setup from the Setup main BIOS setup menu. All Security Setup options, such as password protection and virus protection, are described in this section. To access the sub menu for the following items, select the item and press <Enter>:



Administrator Password

If you have set an administrator password, you should enter the administrator password for accessing the BIOS setup. Otherwise, you will only be able to see or change selected fields in the BIOS setup program.

User Password

If you have set a user password, you must enter the user password for booting and accessing the system; however, some functions may be disabled.

To set an Administrator/User password:

1. Select the option item and press Enter.
2. From the Create New Password box, key in a password, then press enter.
3. Confirm the password when prompted.

To change an administrator password:

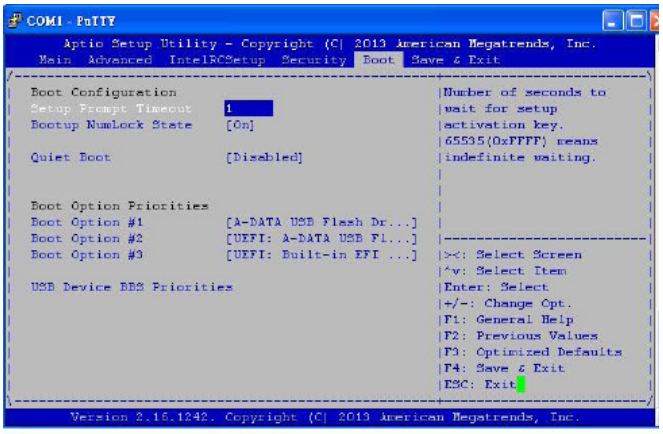
1. Select the option item and press Enter.
2. From the Enter Current Password box, key in the current password, then press enter.
3. From the Create New Password box, key in a new password, then press Enter.
4. Confirm the password when prompted.

To clear the administrator password, follow the same steps as in changing an administrator password, then press Enter when prompted to create/confirm the password.

Boot Configuration

In this screen, you will be able to configure the boot procedures and the related elements.

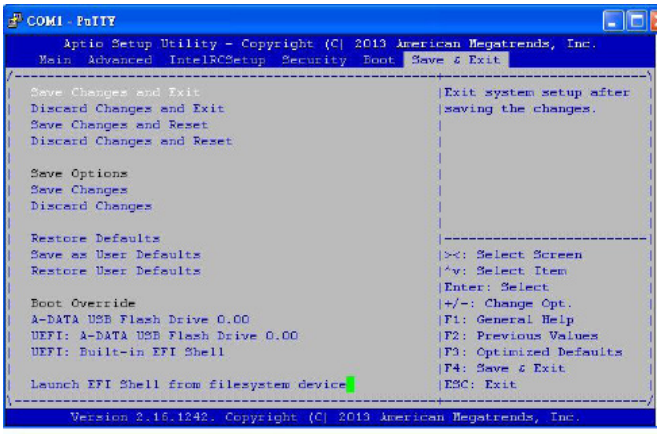
Items	Options
Setup Prompt Timeout	Specify the number of seconds for the boot setup prompt to wait for user's intervention during the POST.
Bootup Num-Lock State	This option lets you to enable or disable the function of the NumLock key.
Quiet Boot	Enabling this item allows the BIOS to suppress the message displayed during the POST.
Set Boot Priority	Use this screen to specify the order in which the system checks for the device to boot from.



Save & Exit

Save and Exit

Select the Exit tab from the setup screen to enter the Exit BIOS Setup screen. You can display an Exit BIOS Setup option by highlighting it using the <Arrow> keys. The following table lists the options in this menu.



Item	Options
Save Changes and Exit	Select this option to save changes and exit the BIOS menu. It will automatically resets if the changes made require rebooting the system to take effect.
Discard Changes and Exit	Select this option to discard changes and exit and BIOS menu to continue the booting process.
Save Changes and Reset	When you have completed the system configuration changes, select this option to leave setup and reboot the computer so the new system configuration parameters can take effect.
Discard Changes and Reset	This option allows you to discard the selections you made and restore the previously saved values. After selecting this option, a confirmation appears. Select Yes to discard any changes and load the previously saved values.
Save Changes	Save your changes
Discard Changes	Discard changes
Restore Defaults	Restore to factory defaults
Save as User Defaults	Save all of your changes as an user default setting.
Restore User Defaults	Loads your saved user default setting.
Boot Override	This section of the boot menu allows booting from a specific device immediately. Therefore you should see an entry for all bootable devices.
Launch EFI Shell from filesystem device	This option allows you to attempt to launch the EFI Shell application (shellx64. efi) from one of the avail-able filesystem devices.

Appendix A: Programming Watchdog Timer

A watchdog timer is a piece of hardware that can be used to automatically detect system anomalies and reset the processor in case there are any problems. Generally speaking, a watchdog timer is based on a counter that counts down from an initial value to zero. The software selects the counter's initial value and periodically restarts it. Should the counter reach zero before the software restarts it, the software is presumed to be malfunctioning and the processor's reset signal is asserted. Thus, the processor will be restarted as if a human operator had cycled the power.

For sample watchdog code, see *watchdog* folder on the *Driver and Manual CD*

To execute the sample code: enter the number of seconds to start count down before the system can be reset. Press start to start the counter and stop to stop the counter..

Dwd_tst --swt xxx (Set Watchdog Timer 1-255 seconds)

wd_tst[*] --start (Start Watchdog Timer)

wd_tst --stop (Stop Watchdog Timer)

For sample watchdog code, see *watchdog* folder on the *Driver and Manual CD*

Appendix B: Setting up Console Redirections

Console redirection lets you monitor and configure a system from a remote terminal computer by re-directing keyboard input and text output through the serial port. This following steps illustrate how to use this feature. The BIOS of the system allows the redirection of console I/O to a serial port. With this configured, you can remotely access the entire boot sequence through a console port.

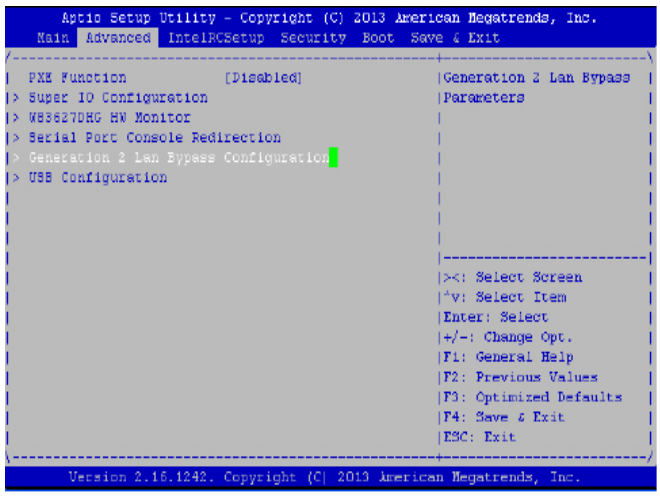
1. Connect one end of the console cable to console port of the system and the other end to serial port of the Remote Client System.
2. Configure the following settings in the BIOS Setup menu:

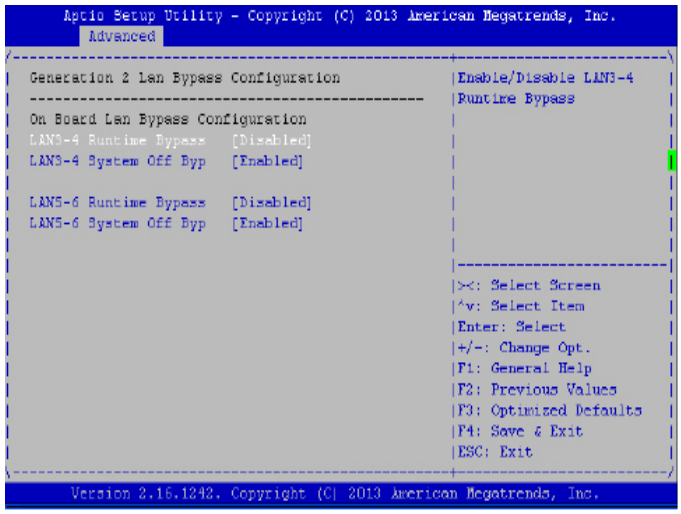
   BIOS > Advanced > Serial Port Console Redirection > Console Redirection Settings > [115200, 8 , None,1]
3. Configure Console Redirection on the client system. The following illustration is an example on Windows platform:
   a. A. Click the start button, point to Programs > Accessories > Communications and select Hyper Terminal.
   b. B. Enter any name for the new connection and select any icon.
   c. Click OK.
   d. From the "Connect to". Pull-down menu, select the appropriate Com port on the client system and click OK.
   e. Select 115200 for the Baud Rate, None. for Flow contorl, 8 for the Data Bit, None for Parity Check, and 1 for the Stop Bit.

Appendix C: Programming Generation 2 LAN Bypass

Lanner Generation 2 Bypass

Lanner Generation 2 bypass is configured through the BIOS menu as shown below:





There are two ways to enable the bypass on the system:

1. The LAN bypass can be turned on or off in two system states, i.e., power on ***(Runtime Bypass)*** and power off ***(System Off Bypass)***. The following are the illustration of the possibilities of LAN bypass configuration with respect to both power-on and power-off states.

Table 1: System Off Bypass is set to ***enabled***

Bypass settings in the BIOS / System Status	Runtime LAN Bypass for the bypass pair		System off LAN Bypass for the bypass pair
	Enabled	Disabled	***Enabled***
System on	Bypass	Non-Bypass	
System off	Bypass	Bypass	

Table 2: System Off bypass is set to ***disabled***

Bypass settings in the BIOS / System Status	Runtime LAN Bypass for the bypass pair		System off LAN Bypass for the bypass pair
	Enabled	Disabled	***Disabled***
System on	Non-Bypass	Non-Bypass	
System off	Non-Bypass	Non-Bypass	

2. A watchdog timer can be used to control the LAN Bypass function dynamically by programming. Lanner also provides sample code for bypass control with WDT via programming. For sample code, look in the LAN_Bypass_Watchdog directory under Driver and Manual CD.

   To compile:

   #gcc wdbp.c -o wdbp

   then switch to a root account to run ./wdbp for excution:

   #./wdbp

   Commands:

   Enable the bypass

   #wdbp.exe –f

   Set Watchdog Timer. This command will set the time interval at which the counter will start count down.

   #wdbp.exe -wl xxx (xxx: 1-255 sec for timer count down)

   Reset Watchdog Timer. This command will reset the watchdog timer's counter and the bypass status to

non-bypass.

#wdbp.exe -wr xxx (xxx: 1-255 sec for timer count down)

Note:

For a description of the physical LAN ports equipped with this functionality, refer to *Front Panel Features* in Chapter 1 Introduction.

Appendix D: Installing Intel QuickAssist Software for Linux

The FW-7551 platform incorporates Intel QuickAssist Technology, which includes acceleration modules that are accessed via Intel QuickAssist software. The Intel quickAssist software also enables the acceleration modules to be easily accessed by open source software such as OpenSSL. The Intel QuickAssist Technology features the acceleration to the following crypto functions:

• Symmetric Cryptographic Functions

– Cipher Operations

– Hash/Authenticate Operation

– Cipher-Hash Combined Operation

– Key Derivation Operation

• Public Key Functions

– RSA Operation

– Diffie-Helman Operation

– Digital Signature Standard Operation

– Key Derivation Operation

– Elliptic Curve Cryptography: ECDSA* and ECDH*

We provide an abstract version of the Intel Intel® Atom™ Processor C2000 Product Family for Communications Infrastructure Software for Linux* Getting Started Guide (No. 518013). In this abstract version of Getting Started guide, it illustrates how to quickly get up and running with Fedora and Intel®**Atom™ Processor C2000 Product Family for Communications Infrastructure Software for Linux Software**. Refer to the attached PDF file for more information.

Appendix E: Terms and Conditions

Warranty Policy

1. All products are under warranty against defects in materials and workmanship for a period of one year from the date of purchase.
2. The buyer will bear the return freight charges for goods returned for repair within the warranty period; whereas the manufacturer will bear the after service freight charges for goods returned to the user.
3. The buyer will pay for repair (for replaced components plus service time) and transportation charges (both ways) for items after the expiration of the warranty period.
4. If the RMA Service Request Form does not meet the stated requirement as listed on "RMA Service," RMA goods will be returned at customer's expense.
5. The following conditions are excluded from this warranty:

Improper or inadequate maintenance by the customer Unauthorized modification, misuse, or reversed engineering of the product Operation outside of the environmental specifications for the product.

RMA Service

Requesting a RMA#

6. To obtain a RMA number, simply fill out and fax the "RMA Request Form" to your supplier.
7. The customer is required to fill out the problem code as listed. If your problem is not among the codes listed, please write the symptom description in the remarks box.
8. Ship the defective unit(s) on freight prepaid terms. Use the original packing materials when possible.
9. Mark the RMA# clearly on the box.

Note: Customer is responsible for shipping damage(s) resulting from inadequate/loose packing of the defective unit(s). All RMA# are valid for 30 days only; RMA goods received after the effective RMA# period will be rejected.

Appendix E

RMA Service Request Form

When requesting RMA service, please fill out the following form. Without this form enclosed, your RMA cannot be processed.

RMA No:	Reasons to Return: ▫ Repair(Please include failure details) ▫ Testing Purpose
Company:	Contact Person:
Phone No.	Purchased Date:
Fax No.:	Applied Date:
Return Shipping Address: _____	
Shipping by: ▫ Air Freight ▫ Sea ▫ Express_____ ▫ Others:_____	

Item	Model Name	Serial Number	Configuration

Item	Problem Code	Failure Status

*Problem Code:

01:D.O.A.	07: BIOS Problem	13: SCSI	19: DIO
02: Second Time R.M.A.	08: Keyboard Controller Fail	14: LPT Port	20: Buzzer
03: CMOS Data Lost	09: Cache RMA Problem	15: PS2	21: Shut Down
04: FDC Fail	10: Memory Socket Bad	16: LAN	22: Panel Fail
05: HDC Fail	11: Hang Up Software	17: COM Port	23: CRT Fail
06: Bad Slot	12: Out Look Damage	18: Watchdog Timer	24: Others (Pls specify)

Request Party *Confirmed By Supplier*

_____ _____

Authorized Signature / Date Authorized Signature / Date